What is claimed is:

1. A drive control device for a direct current motor for rotating a rotor, which includes output MOS transistors for making desired currents flow into coils of the direct current motor, detects currents flowing into the coils of the direct current motor, compares with a demand current, determines amount of currents to be made to flow into the coils of respective phases by the output MOS transistors, and in order that the output MOS transistors makes the amount of currents flow, controls pulse widths of control signals to supply to drive circuits of the output MOS transistors, the drive control device comprising:

current sensing MOS transistors having a predetermined size ratio to the output MOS transistors, in which source terminals thereof are commonly coupled to source terminals of the output MOS transistors, and to gate terminals thereof are applied signals identical to signals being applied to gate terminals of the output MOS transistors; and

a voltage applying circuit that monitors drain voltages of the output MOS transistors, and applies voltages identical to the drain voltages to the drain terminals of the current sensing MOS transistors.

2. A rotation drive system for a direct current motor including:

a direct current motor;

output MOS transistors for making desired currents flow into coils of the direct current motor; and

a motor drive control device for rotating a rotor, which detects currents flowing into the coils of the direct current motor, compares with a demand current, determines an amount of currents to be made to flow into the coils of respective phases by the output MOS transistors, and in order that the output MOS transistors make the amount of currents flow, controls pulse widths of control signals to supply to drive circuits of the output MOS transistors,

wherein the motor drive control device comprises:

current sensing MOS transistors having a predetermined size ratio to the output MOS transistors, in which source terminals thereof are commonly coupled to source terminals of the output MOS transistors, and to gate terminals thereof are applied signals identical to signals being applied to gate terminals of the output MOS transistors; and

a voltage applying circuit that monitors drain voltages of the output MOS transistors, and applies voltages identical to the drain voltages to the drain terminals of the current sensing MOS transistors.

3. A rotation drive system for a direct current motor according to Claim 2, wherein the output MOS transistors and

the current sensing MOS transistors are configured to operate in a non-saturation region.

4. A rotation drive system for a direct current motor according to Claim 3, wherein the voltage applying circuit comprises:

a first MOS transistor in which a gate terminal thereof is capable of coupling to the drain terminals of the output MOS transistors;

a second MOS transistor in which a gate terminal thereof is coupled to the drain terminals of the current sensing MOS transistors;

a differential amplifying circuit in which a source-side voltage of the first MOS transistor is coupled to a non-inverted input terminal thereof, and a source-side voltage of the second MOS transistor is coupled to an inverted input terminal thereof;

a third MOS transistor which is coupled to the drain terminal of the second MOS transistor and in which an output of the differential amplifying circuit is applied to a gate terminal thereof; and

a current/voltage conversion function coupled in series to the third MOS transistor.

5. A rotation drive system for a direct current motor according to Claim 4, wherein a resistive element to give a

predetermined potential difference between differential input terminals of the differential amplifying circuit is coupled in series to the first MOS transistor.

6. A rotation drive system for a direct current motor according to Claim 5, further comprising a voltage holding function capable of holding a voltage outputted from the current/voltage conversion function, wherein, before starting a current-carrying into the coils of the motor, the voltage holding function is made to hold a voltage outputted from the current/voltage conversion function in a state that the current sensing MOS transistors are turned on without making the currents flow into the coils, and during the current-carrying into the coils of the motor, a relative variation between a voltage held in the voltage holding function and an inputted demand current is used as the actual demand current.

7. A rotation drive system for a direct current motor according to Claim 4, wherein between the drain terminals of the output MOS transistor and the gate terminal of the first MOS transistor, the rotation drive system is provided with a switch function that is controlled turning on and off based on a gate voltages of the output MOS transistors.

8. A rotation drive system for a direct current motor

according to Claim 4, wherein the output MOS transistors and the current sensing MOS transistors are formed on one semiconductor substrate in a manner that the output MOS transistors are located on the peripheries of an area where the current sensing MOS transistors are formed.

9. A semiconductor integrated circuit for driving coils, comprising output transistors that make drive currents flow into the coils, and current sensing transistors for detecting the currents flowing into the coils, being formed in a smaller size than the output transistors, wherein the output transistors and the current sensing transistors are formed into a high-withstanding voltage transistor having device isolation regions on the peripheries of each transistor, and the output transistors are formed so as to surround the four sides of the current sensing transistors.

10. A semiconductor integrated circuit for driving coils according to Claim 9, wherein the output transistors and the current sensing transistors are each formed of MOS transistors, and the source regions of the MOS transistors are made into a double structure in which a second semiconductor region being the same conductive type as a first semiconductor region is formed in the first semiconductor region.